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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/747,174	12/22/2000	Daniel S. Sem	P-TB 3997	5507

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EXAMINER	
BORIN, MICHAEL L	

ART UNIT	PAPER NUMBER
1631	10

DATE MAILED: 01/08/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.	Applicant(s)
09/747,174	Sem et al.
Examiner	**Art Unit**
Michael Borin	1631

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136 (a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1) ☒ Responsive to communication(s) filed on *Oct 21, 2002*.

2a) ☐ This action is **FINAL.** 2b) ☒ This action is non-final.

3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11; 453 O.G. 213.

Disposition of Claims

4) ☒ Claim(s) *1-44* is/are pending in the application.

4a) Of the above, claim(s) *1-18 and 24-44* is/are withdrawn from consideration.

5) ☐ Claim(s) _____ is/are allowed.

6) ☒ Claim(s) *19-23* is/are rejected.

7) ☐ Claim(s) _____ is/are objected to.

8) ☐ Claims _____ are subject to restriction and/or election requirement.

Application Papers

9) ☐ The specification is objected to by the Examiner.

10) ☐ The drawing(s) filed on _____ is/are a) ☐ accepted or b) ☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

11) ☐ The proposed drawing correction filed on _____ is: a) ☐ approved b) ☐ disapproved by the Examiner.

If approved, corrected drawings are required in reply to this Office action.

12) ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

13) ☐ Acknowledgement is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a) ☐ All b) ☐ Some* c) ☐ None of:

1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

*See the attached detailed Office action for a list of the certified copies not received.

14) ☐ Acknowledgement is made of a claim for domestic priority under 35 U.S.C. § 119(e).

a) ☐ The translation of the foreign language provisional application has been received.

15) ☐ Acknowledgement is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO-1449) Paper No(s). *4,5*
4) ☐ Interview Summary (PTO-413) Paper No(s). _____
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other:

DETAILED ACTION

Status of Claims

Responses to restriction and election requirements filed 07/02/02 and 10/21/02 are acknowledged. Applicant elected, with traverse, Group III, claims 19-23. Examiner maintains that methods I-VIII either have different steps or modes of operation (e.g. Groups I and II, or II and VII), and/or they have different functions or effects (e.g., Groups I and VII), and/or they not disclosed as capable of use together (e.g., methods III and VII). The restriction requirement is still deemed proper and is therefore made FINAL. Claims 1-18, 24-44 are withdrawn from further consideration by the examiner, 37 CFR 1.142(b), as being drawn to a non-elected groups. Cancellation of claims 1-18, 24-44 is requested.

In regard to election of species, applicants elected NAD as ligand species and requested to address other NAD-related molecules as well. Applicant's arguments are deemed convincing and NAD-related molecules are addressed in the following Office action.

In response to further election of species requirement, applicant elected, with traverse, pharmacofamily 3 as species of polypeptide pharmacofamily. Applicant's traverse addresses the election of species requirement as a restriction requirement, which it was not. The requirement was made for the purposes of initial examination

on merits; other species would have been addressed if claims drawn to elected species have been found allowable. However, upon further consideration of the election of species requirement mailed 9/13/02, the requirement was deemed unnecessary because claim 20 reciting polypeptide pharmacofamilies is not further limiting the method claims (see rejection under 35 U.S.C. 112, second paragraph, below). Consequently, the election of species requirement is hereby withdrawn.

Information Disclosure Statement

Applicants' Information Disclosure Statements filed 5/21/02 and 4/15/02 have been received and entered into the application. Accordingly, as reflected by the attached completed copies of forms PTO-1449, the cited references have been considered.

Title, Abstract

The title and abstract of the invention are not descriptive. The title and abstract do not reflect the elected invention. A new title and abstract are required which are clearly indicative of the invention to which the elected claims are directed

Drawings

The drawings are objected because of the defects noted on the PTO-948.

Applicants are hereby notified that the required timing for the correction of drawings have changed. See the last 6 lines on the sheet which is attached entitled "Attachment to PTO-948 (Rev. 03/01 or earlier)". Pursuant to the above notification, applicants are required to submit drawing correction within the time period set for responding to this Office action. Failure to respond to this requirement may result in abandonment of the instant application or in a notice of failure to fully respond to this Office action.

Claim Objections

Claim 20 is objected to under 37 CFR 1.75(c), as being of improper dependent form for failing to further limit the subject matter of a previous claim. The list of pharmacofamilies recited in the claim does not affect or further limit the method steps of the base claim 19. Applicant is required to cancel the claim, or amend the claim to place it in proper dependent form, or rewrite the claim in independent form.

Claim Rejections - 35 USC § 112, second paragraph.

The following is a quotation of the second paragraph of 35 U.S.C. 112:

> The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

Claim 20 is rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention. It is not clear what are additional limitations, if any, recited in the claim. The list of pharmacofamilies recited in the claim does not affect or further limit the method steps recited in the base claim 19. It is these method steps that determine the nature of pharmacofamily identified and naming of pharmacofamilies expected to be identified does not further limit steps of the method as claimed.

Claim Rejections - 35 USC § 102.

The following is a quotation of the appropriate paragraphs of 35 U.S.C.102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless --
>
> (b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

Claims 19-23 are rejected under 35 U.S.C. 102(b) as anticipated by Carugo et al. (Proteins:Structure, Function and Genetics 28: 10-28, 1997).

The instant claims are drawn to method of identifying polypeptide pharmacofamilies exhibiting binding specificity to different conformations of a ligand. Pursuant to the election of species, the ligand species under consideration are nicotine amide-related molecules [1]. The method includes the steps of identifying various conformations of the ligand in its complexes with different polypeptides of a polypeptide family[2], and identifying more than one of said various conformations of the ligand in its complexes with different polypeptides, and thereby identifying polypeptide pharmacofamilies as groups of polypeptides as having binding specificity to a particular conformation of the ligand.

Carugo et al. examines complexes of NAD and NADP with various polypeptides. In particular, the study describes 13 different NADP conformations (Fig. 3), and

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[1]A peptide pharmacofamily is defined as a population of polypeptides that bind to the ligand (nicotine amide-related molecule) such that the latter is substantially the same conformation in complexes with all peptide members of pharmacofamily.

[2]A polypeptide family encompasses any peptides capable of binding to the given ligand (see p. 15).

identifies groups of polypeptides having binding specificity to a particular conformation of NADP (Fig. 2). For example, cluster 1 (which reads, using the language of instant claims on pharmacofamily 1) includes malate-, lactate-, alcohol-, formate-dehydrogenases, etc (see Fig. 2 and p. 12). The referenced method reads on the claimed method of identifying polypeptide pharmacofamilies.

As for the claim 20, as addressed above, the list of pharmacofamilies recited in the claim does not affect or further limit the method steps recited in the base claim 19. It is these method steps that determine the nature of pharmacofamily identified and naming of pharmacofamilies expected to be identified does not further limit steps of the method as claimed.

It is the Examiners position that all the elements of Applicant's invention with respect to the specified claims are instantly disclosed by the teaching of the reference cited above.

Claim Rejections - 35 USC § 112, first paragraph.

The following is a quotation of the first paragraph of 35 U.S.C. 112:

> The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person

skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

Claims 19-23 are rejected under 35 U.S.C. 112, first paragraph, because the specification, while being enabling for method as claimed using NADP, does not reasonably provide enablement for utilizing other nicotine amide-related molecules as ligands. The specification does not enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to use the invention commensurate in scope with these claims.

The instant claims are drawn to method of identifying polypeptide pharmacofamilies exhibiting binding specificity to different conformations of a ligand[1]. Pursuant to the election of species, the ligand species under consideration are nicotine amide-related molecules. The method includes the steps of identifying various conformations of the ligand in its complexes with different polypeptides of a polypeptide family[2], and identifying more than one of said various conformations of the ligand in its complexes with different polypeptides, and thereby identifying polypeptide pharmacofamilies as groups of polypeptides as having binding specificity to a particular conformation of the ligand.

Prior art demonstrates that while NADP binds to polypeptides in a variety of conformations, conformation of NAD is well conserved and does not change significantly upon binding to various polypeptides. Thus, Bellamacina teaches that nicotinamide binding proteins all bind their NAD cofactor in the same location and orientation, with the cofactor itself adopting a similar extended conformation in every structure. Carugo teaches that although the protein-cofactor interactions are quite variable in NADP complexes, they are largely conserved in those of NAD. Thus, prior art does is not predictable in regard to identifying polypeptide pharmacofamilies based on variability in conformation of nicotine amide-related molecules other than NADP.

Similarly, the instant specification describes how to use NADPH as a ligand in identifying pharmacofamilies of polypeptides (Example 1). There are no working examples or guidance on how to practice the invention with nicotine amide-related molecules other than NADPH.

In view of the above, it is the Examiners position that with the insufficient guidance and working examples and in view of unpredictability and the state of art one skilled in the art could not make and/or use the invention with the claimed breadth without an undue amount of experimentation.

Conclusion.

No claims are allowed.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Michael Borin whose telephone number is (703) 305-4506. Dr. Borin can normally be reached between the hours of 8:30 A.M. to 5:00 P.M. EST Monday to Friday. If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Mr. Michael Woodward, can be reached on (703) 308-4028. The fax telephone number for this group is (703) 305-3014.

Any inquiry of a general nature or relating the status of this application should be directed to the Group receptionist whose telephone number is (703) 308-0196.

MICHAEL BORIN, PH.D
PRIMARY EXAMINER

December 27, 2002

mlb